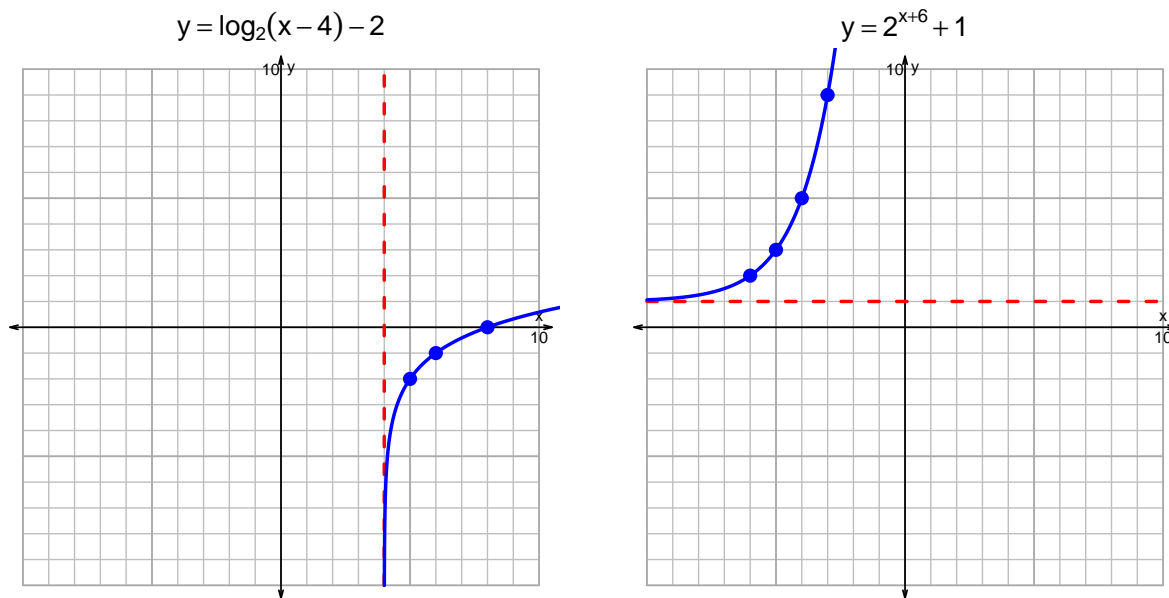


Name: \_\_\_\_\_

Date: \_\_\_\_\_

## s18: EXP LOG (SLTN v333)

1. (10 pts) Graph  $y = \log_2(x - 4) - 2$  and  $y = 2^{x+6} + 1$  on the grids below. Also, draw any asymptotes with dashed lines.



*Somewhat useful hint:  $2^3 = 8$ , and thus  $\log_2(8) = 3$ .*

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-29 = \left(\frac{-7}{5}\right) \cdot 2^{3t/4}$$

Divide both sides by  $\frac{-7}{5}$ .

$$\frac{29 \cdot 5}{7} = 2^{3t/4}$$

Take log, base 2, of both sides.

$$\log_2 \left( \frac{29 \cdot 5}{7} \right) = \frac{3t}{4}$$

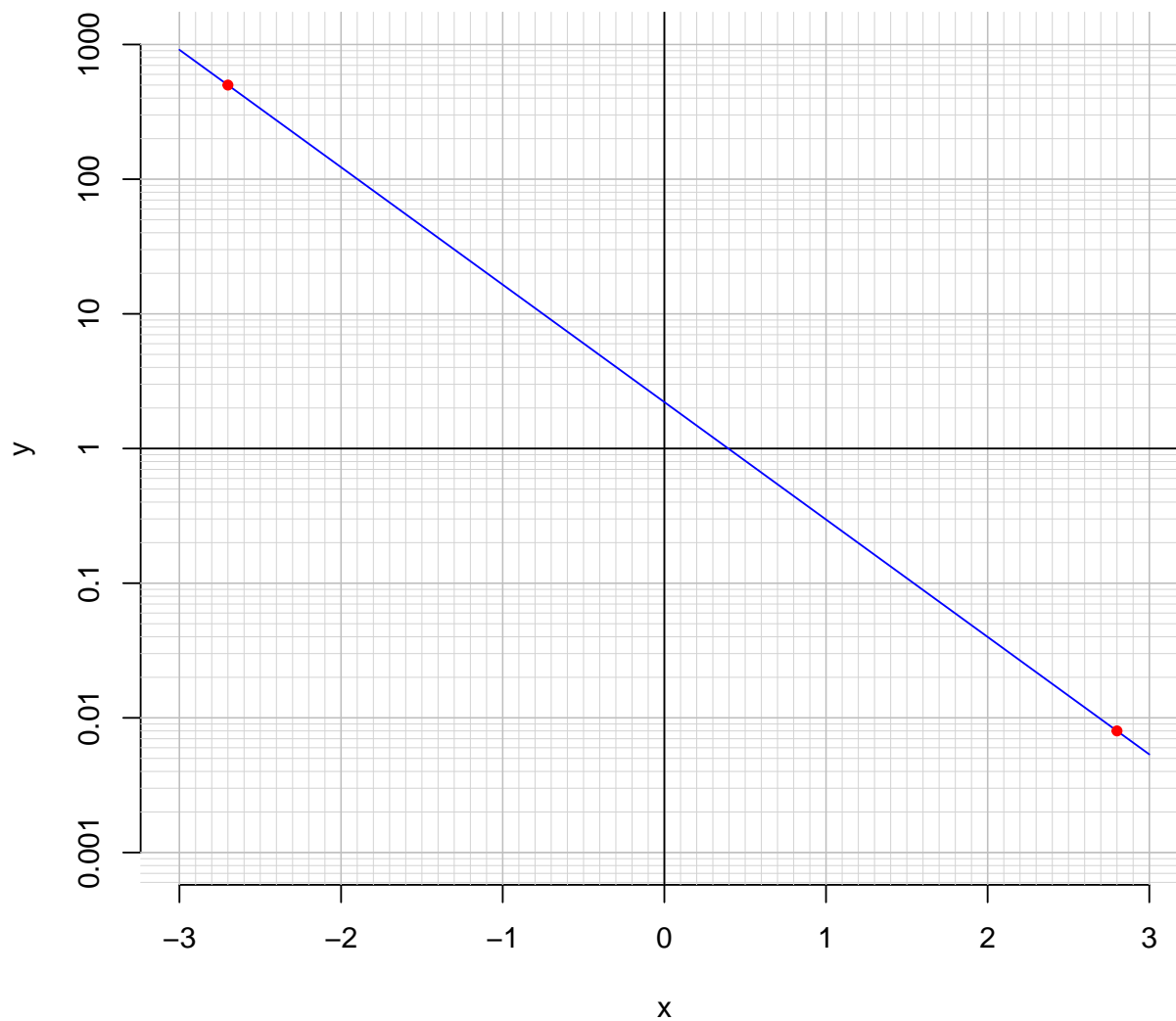
Divide both sides by  $\frac{3}{4}$ .

$$\frac{4}{3} \cdot \log_2 \left( \frac{29 \cdot 5}{7} \right) = t$$

Switch sides.

$$t = \frac{4}{3} \cdot \log_2 \left( \frac{29 \cdot 5}{7} \right)$$

3. (10 pts) An exponential function  $f(x) = 2.21 \cdot e^{-2.01x}$  is graphed below on a semi-log plot.



- a. Using the plot above, evaluate  $f(-2.7)$ .

$$f(-2.7) = 500$$

- b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{2.01} \cdot \ln\left(\frac{x}{2.21}\right)$$

Using the plot above, evaluate  $f^{-1}(0.008)$ .

$$f^{-1}(0.008) = 2.8$$